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NCRAR Newsletter

National Center for Rehabilitative Auditory Research, Portland, OR

A VA RR&D Center of Excellence

Special points of interest:

- NCRAR Introduces New Vestibular Laboratory
- 2013 NCRAR Conference News
- Meet Bonnie Becker, Administrative Assistant
- NCRAR Seminar Series
- Meet Our Students
- 2012 NCRAR Open House

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Note from the Director: Patrick Feeney

The NCRAR has been hopping lately with our National Advisory Board (NAB) meeting in September, that followed hot on the heels of our Strategic Planning meeting. The NAB met with most Center personnel to learn about current research initiatives, plans for the future and potential areas of growth for us. We enjoyed their visit and valued their guidance as we move forward.

This current issue of the Newsletter highlights our new balance laboratories, which will allow us to add platform posturography, rotary chair and videonystagmography to our assessment armamentarium. You will learn about several ongoing research studies that are taking advantage of this new addition to the NCRAR, as well as areas we will explore in the future.

Needless to say, we are very excited about the expanded research opportunities offered by the new labs.

We have also been continuing our participation in the VA and Department of Defense (DoD) Auditory Research Working Group with Erick Gallun, Jim Henry and myself attending a recent meeting in Dayton, Ohio. Several collaborative investigations are under development between investigators from the NCRAR and DoD, which will study issues common to Veterans and Service Members, such as assessment and rehabilitation for mild traumatic brain injury.

We hope you enjoy this issue of the NCRAR Newsletter, and we would be happy to provide you with a tour of the new vestibular/balance laboratories. I would also like to take this opportunity to recognize NCRAR investigators Dr. Michelle Molis and Dr. Samantha Lewis on the exceptional grant scores they received from VA

NCRAR Introduces New Vestibular Laboratory

By: Sean Kampel, Au.D.

Over the past 15 years, the NCRAR has steadily expanded in its scope of research in the areas of audiological diagnostics and rehabilitation. To complement our hearing and tinnitus programs, this year we are pleased to announce the addition of vestibular and balance research to the NCRAR portfolio. Over the past several months, the NCRAR has designed a balance laboratory comprised of computerized dynamic posturography (CDP), rotary chair testing (RC) and videonystagmography (VNG), with vestibular evoked myogenic potential (VEMP) capability to be added in the near future. Additionally, we will be incorporating a mobility lab in the near future, which will allow for the capture of human movement via sensors that contain accelerometers, gyroscopes, and magnetometers. Through these developments, it is our goal to create an environment that is supportive of research in the areas of vestibular and balance disorders, examining both diagnostics and rehabilitation in the Veteran population. We believe that this new audiologic component adds a crucial line of research that will serve Veterans with a variety of disorders and impairments. The first balance study conducted at NCRAR began in August 2012,

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Save The Date!

NCRAR Conference
September 18-20, 2013
Beyond the Audiology Clinic: Innovations and Possibilities of Connected Health

This year's conference will address an array of topics pertaining to teleaudiology:

- Principles and Methodologies,
- Technologies and Implementation,
- Rehabilitation and Interventions,
- Implications for Audiological Practice.

Invited presenters:

Harvey Abrams, Terry Chisolm, Deborah Ferarri, Chad Gladden Louise Hickson, Jeffrey Kaye, John Kokesh, Elizabeth Krupinski, Robert Margolis, and Jerry Northern.

Stay tuned to the NCRAR website for conference updates, registration information and scholarship opportunities (http://www.ncrar.research.va.gov/).

NCRAR Seminar Series

Monthly seminars presented by renowned scientists from around the world.
All seminars take place 12-1 pm Pacific Time in PVAMC Building 101, Room 109. Most are also broadcast live via v-tel to other VA facilities and are available on DVD by request from Bonnie.Becker@va.gov

November 2:	Nina Kraus, Ph.D. School of Communication, Northwestern University.
December 7:	Margaret Wallhagen, Ph.D. Department of Physiological Nursing, UCSF.
January 11 :	Michelle Cameron, M.D., P.T. Department of Neurology, Oregon Health & Science University.

NCRAR Lending Library

Clinicians and researchers can now borrow DVDs of previous presentations, including presentations from previous NCRAR conferences. For a list of DVDs available, check out the website:

http://www.ncrar.research.va.gov/Education/Clinician_Resources/Index.asp

and contact ncrar@va.gov with the title of the DVD you would like to borrow.

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Meet Bonnie Becker, Administrative Assistant

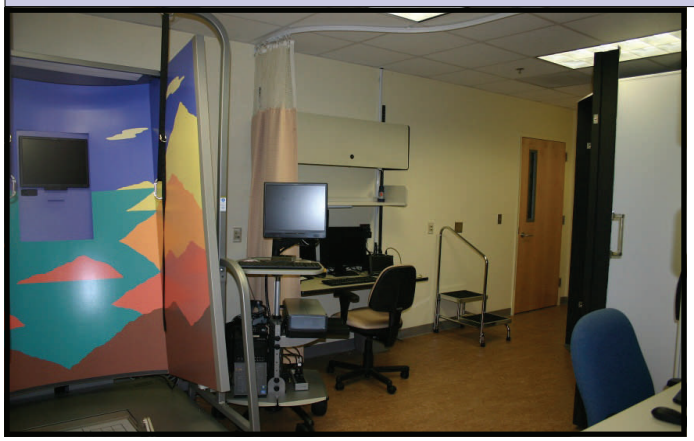
I'm not sure why the folks who put this publication together think I have an exciting enough life for this section of the newsletter, but I accepted the challenge of trying to explain my 60+ years here on this great planet. Born in the 1950s on a small, really small, farm in Iowa, I lived a pretty sheltered life. There was a stone quarry on one side of the property and a golf course on the other. When I was three I was playing outside with my cat. It was a sunny March day; the sun bouncing off the snow drifts while the cat was romping in those fluffy, cottony snow drifts and I was romping right behind him. Well, he missed a step and ended up going over the edge of the cliff and down 63- feet into the bottom of the quarry. We all know a cat has 9 lives and he was not harmed. While I don't remember any of it, I guess I wanted to see for myself and I followed him right over the cliff…yes the same 63-feet down that he experienced. After a few frantic minutes (or maybe longer) my father found me at the bottom of that pit, broken but quite alive. And I'm told the cat was overjoyed when he saw my father. After that incident, I spent 6 months in a full body cast, and had another 6+ months of physical therapy. I can say, thankfully however, that I had no lasting effects, save for some arthritis in my old age. That was one of many miracles that have happened to me over the years, but probably the most poignant. Despite that incident, I had a wonderful childhood.

After college I worked at the Mayo Clinic for 12 years, but the harsh Minnesota winters prompted me in 1983 to move my young daughters across the country to beautiful Oregon. Here, we experienced mild winters, beautiful mountains and of course, the ocean. In the early 1990s, I made a trek to San Francisco for a job at UCSF, but the beauty of Oregon and a new job at the Portland VA brought me back a few years later. For 5 years I worked here in a VA Central Office-funded position in the Office of Standards in Human Studies Research. We conducted site visits to various VA Research Departments, auditing the human studies research areas. This was a very interesting job and I gathered quite a bit of expertise in human studies research, institutional review boards, and all that it entails.

I have been employed by the NCRAR since 2003, and enjoy all of the wonderful people here. We recently had one of those "dreaded" employee retreats, but I must say it was a very pleasant experience and reminded me once again what a bright group of people I work with. While my title is "Special Assistant," I am one of three administrative personnel at the NCRAR. I am also the Continuing Education Administrator for all NCRAR educational endeavors. As many of you who receive this newsletter are aware, as part of our educational mission the NCRAR hosts wonderful monthly seminars which provide continuing education credits to those who qualify for them. We also make available DVDs so that all of the VAs can use them to train audiologists in their own facilities. Managing this aspect of the education program is just one of my many duties at the NCRAR.

I have two beautiful daughters, four magnificently brilliant grandchildren, and a couple of cool sons-in-law. Unfortunately they do not live close, so I must occasionally travel to tropical, beautiful Manzanillo, Mexico, to visit one family, or to sunny Los Angeles to visit the other. Rough life, but someone has to do it! In my spare time, I love to cook, and also volunteer at several local homeless shelters and my church. I am also involved in various community boards and committees that deal with the less fortunate. If you stop by my office you will see a statement taped to my door; which is truly what I believe: "The day I can afford superfluous spending is the day I know I'm not doing enough to feed, clothe, and shelter those who are suffering in my community." Oh, and if you're wondering…you are seeing my kindergarten picture…definitely a "bad hair day" for me! The other picture is of a group of my friends and I, helping serve pulled pork to 150 men at a local homeless shelter.

NCRAR Introduces New Vestibular Laboratory (Continued)



Above: The vestibular laboratory at the NCRAR, which contains computerized dynamic posturography and a rotary chair.

when Principal Investigator Dr. Michelle Cameron transitioned her VA RR&D Service grant, entitled "Mechanisms of Imbalance in Individuals with Multiple Sclerosis," to the NCRAR. The first specific aim of Dr. Cameron's study is to determine the primary mechanism underlying imbalance in people with multiple sclerosis (MS). Although a number of impairments may exist, Dr. Cameron's goal is to improve the prevention of falls by investigating whether a primary impaired balance mechanism can be detected in individuals with MS. The second aim is to determine whether a novel test termed the Balance Evaluation Systems Test (BESTest) can be used as an alternative to Computerized Dynamic Posturography (CDP) testing. CDP is a valuable clinical test for both assessment and rehabilitation, however CDP units are expensive which may result in limited access. Results of the 2 tests will be compared to see if similar quality and types of information can be generated. The final aim of the study is to determine if results from the BESTest and CDP test are longitudinally correlated with the falls and imbalance of MS patients. Results will indicate whether these tests could be used as potential predictors of falls in this patient population. Preliminary data from a cohort of 58 MS patients indicate that people with MS fall frequently. Specifically, two-thirds of participants fell at least once in a 6-month period, and many of these individuals fell multiple times over that same timeframe. Dr. Cameron has recently obtained funding for another research initiative investigating a potential treatment to improve balance and walking in individuals with MS. The goal of that study is to assess whether methylphenidate (Ritalin), a stimulant that has been found to improve walking and reduce fall risk in other populations, has the same effect in individuals with MS. For that study CDP testing will be used to compare balance function in individuals taking methylphenidate for 6 weeks versus a matched placebo.

Planning is also underway to add a balance assessment component to an NCRAR follow-up study entitled "Central Auditory Deficits Associated with Blast Exposure." With blast exposure being considered the hallmark wound in recent US conflicts, the goal of the initial study was to develop more sensitive test measures that correlate with auditory dysfunction reported by blast-exposed Veterans. Difficulty with speech understanding that is disproportionate to audiometric thresholds is an example of such a disorder reported by this population. The study used electrophysiological measures and a behavioral central auditory test battery to determine whether those exposed to high-intensity blasts exhibit measurable auditory deficits, despite having essentially normal audiometric thresholds. The study is now in the process of adding cognitive measures, new auditory components and balance assessment components, including CDP. The aim of the next phase is to investigate whether central auditory deficits co-occur with cognitive and balance deficits, and if there is a relationship between these deficits. There is evidence that blast exposure does affect the balance system, and that these deficits do not resolve on their own.

The primary focus of the NCRAR has been on auditory disorders affecting Veterans. With the recent addition of the new balance and vestibular lab, we are excited to increase our scope of audiologic research to include a greater range of disorders and deficits affecting Veterans. Some of our long-term plans include refining existing vestibular and balance tests, developing new tests to improve diagnostics, and improving vestibular and balance rehabilitation. Additional NCRAR balance and vestibular research interests include the investigation of aging and balance, and balance deficits associated with Parkinson's disease. Though only in its infancy, NCRAR's new vestibular and balance research programs are expected to grow over the next several years. It is our continued mission to ultimately improve quality of life for our Veterans, now with the additional domain of prevention, diagnosis and treatment of balance and vestibular impairments.

Right: The new rotary chair located in NCRAR's vestibular laboratory.

NCRAR publications and presentations July 2012 to October 2012

Publications

Gallun FJ, Diedesch AC, Beasley R. Impacts of age on memory for auditory intensity. Journal of the Acoustical Society of America. 2012; 132(2): 944-956. PMID: 22894216.

Molis MR, Diedesch A, Gallun F, Leek MR. Vowel identification by amplitude and phase contrast. Journal of the Association for Research in Otolaryngology. 2012 (On-Line) DOI 10.1007/s10162-012-0352-1

Saunders GH. (2012). 20Q: Auditory Training - Does it Really Work? Invited article for AudiologyOnline accessible at: http://www.audiologyonline.com/articles/article_detail.asp?article_id=2458

Saunders GH, Forsline A. Hearing aid counseling: Comparison of single-session informational counseling with single-session performance-perceptual counseling. International Journal of Audiology, 2012; 51(10):754-64.

Seixas NS, Neitzel R, Stover B, Sheppard L, Feeney P, Mills D, Kujawa S. Cortical encoding of signals in noise: Effects of stimulus type and recording paradigm. Occupational and Environmental Medicine. 2012;69:643-650.

Publications in Press

Henry JA, McMillan GP, Thielman EJ, Galvez G, Zaugg TL, Porsov E, Silaski G,. Evaluating psychoacoustic measures for establishing the presence of tinnitus. Journal of Rehabilitation Research and Development. In Press.

Henry JA, Roberts LE, Ellingson RM, Thielman EJ. Computer-automated tinnitus assessment: noise-band matching, maskability, and residual inhibition. Journal of the American Academy of Audiology. In Press.

McMillan G, Hanson T, Saunders GH, Gallun F. A two-component circular regression model for repeated measures auditory localization data. Journal of the Royal Statistical Society Series C, In press.

Saunders GH, Echt KV. Blast Exposure and Dual Sensory Impairment. Invited article for Special Issue: Sensory and Communicative Disorders in Blast-Related Injuries. Journal Rehabilitation Research and Development. In Press.

Submitted

Dille MF, Ellingson RM, McMillan GP, Konrad-Martin D. ABR obtained from time efficient train stimuli for cisplatin ototoxicity monitoring. Journal of the American Academy of Audiology. Submitted September, 2012

Dille MF, Jacobs PG, Gordon SY, Helt WJ, McMillan GP. A new extended frequency portable audiometer for ototoxicity monitoring, the OtoID. Journal of Rehabilitation Research & Development. Submitted September, 2012.

Ommaya AK, Adams KM, Allman RM, Collins EG, Cooper RA, Dixon CE, Fishman PS, Henry JA, Kardon R, Kerns RD, Kupersmith J, Lo A, Macko R, McArdle R, McGlinchey RE, McNeil MR, O'Toole TP, Peckham PH, Tuszynski MH, Waxman SG, Wittenberg GF. Research opportunities in rehabilitation research. Journal of Rehabilitation Research and Development. Submitted September, 2012.

Pope DS, Gallun FJ, Kampel S. Effect of hospital noise on patients' ability to hear, understand and recall speech. Research in Nursing & Health. Submitted September, 2012.

Pope DS, Kampel S, Gallun FJ. Sensitivity of a bedside hearing screening question for hospitalized military veterans. Research in Nursing & Health. Submitted September, 2012.

Sabin A, Gallun FJ, Souza PE. Measurement and prediction of sensitivity to dynamic range compression. Journal of the Acoustical Society of America. Submitted September, 2012.

Saunders GH, Frederick MT, Silverman S, Papesh M. Application of the Health Belief Model to hearing health behaviors. International Journal of Audiology. Submitted October, 2012.

Presentations

Bennett KO, Molis MR, Leek MR. Auditory stream segregation of sequentially presented vowel sounds. Poster presented at: International Hearing Aid Research Conference (IHCON); 2012, August 8-12, Lake Tahoe, CA.

Recent publications and presentations (July 2012-October 2012) continued

Billings C. Brain and behavioral measures of speech perception in noise. Podium presented at: NCRAR Seminar Series; 2012, September, Portland, OR.

Dullard B, Saunders GH. Qualitative Investigation of Service Provision in the Dual Sensory Impaired Population. Poster presented at: the Academy of Rehabilitative Audiology Institute; 2012 Sept 9-11, Providence, RI.

Gallun, FJ. Impacts of aging, hearing loss, and traumatic brain injury on binaural and spatial hearing . Invited presentation at Boston University Hearing Research Center Seminar Series; 2012, Sept 14, Boston, MA.

Gallun FJ, McMillan G, Saunders G. A statistical modeling approach to characterizing sound localization on a horizontal plane. Poster presented at: International Hearing Aid Research Conference (IHCON); 2012, August 8-12, Lake Tahoe, CA.

Henry JA. Progressive Tinnitus Management: What Audiologists Should Know. Invited lecture presented at University of Washington, Dept. of Speech and Hearing Sciences; 2012, July 5; Seattle, WA.

Henry JA. Proposed New Program: VA/DoD Tinnitus Education Alliance. Invited presentation at the Meeting of the Department of Defense/Veterans Affairs Auditory Research Working Group (DoD/VA ARWG); 2012, September 18, Dayton, OH.

Henry JA, Zaugg TL, Myers PJ, Baldwin R, Ribbe C. Tinnitus Symposium. Invited training conference by ReSound Government Services National Training Seminar; 2012 July 11-12; Portland, OR.

Henry JA, Zaugg TL, Myers PJ, Schmidt CJ. Progressive Tinnitus Management: Part 1. eAudiology web seminar; 2012, August 7, (invited presentation).

Henry JA, Zaugg TL, Myers PJ, Schmidt CJ. Progressive Tinnitus Management: Part 2. eAudiology web seminar; 2012, August 14, (invited presentation).

Henry JA. Answering Your Questions About Tinnitus. Invited telephone presentation to the Washington D.C. Tinnitus Support Group; 2012, August 14.

Lewis, M.S., Gallun, F., Gordon, J., Saunders, G. Assessing the effect of different hearing-aid microphone polar patterns on speech intelligibility in noise. Poster presented at IHCON; 2012, August 8-12; Lake Tahoe, CA.

Lewis, M.S., McMillan, G., Goheen, C., McDermott, D., Casiana, L. The International Outcome Inventory for Hearing Aids for the Significant Other: Results from a Veteran sample. Poster presented at IHCON; 2012, August 8-12; Lake Tahoe, CA.

Sabin AT, Souza P, Gallun FJ. Sensitivity to dynamic range compression is predictable by distances between modulation spectra. Poster presented at: International Hearing Aid Research Conference (IHCON); 2012, August 8-12, Lake Tahoe, CA.

Saunders, GH. Outcome measures: What can they tell me that my patient can't? Invited presentation for AudiologyOnline Hearing Aid Week; 2012, September 14; available: kttp://www.audiologyonline.com/audiology-ceus/course/hearing-aid-week-2012-a-hearing-aids-adults-outcome-measures-what-can-they-21163

Saunders GH, Papesh M, Teahen, M, Silverman S. Hearing Health Beliefs. Paper presented at: International Hearing Aid meeting (IHCON); 2012, August 8-12, Lake Tahoe, CA.

Saunders GH, Teahen M, Silverman S. Hearing health behaviors and the Health Belief Model. Presentation at the Academy of Rehabilitative Audiology Institute; 2012, Sept 9-11, Providence, RI.

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NCRAR: Meet Our Students

Every year, the NCRAR hosts Audiology graduate summer students, student interns, as well as one or more students completing their Au.D. externship who work at the Center with us. In this section, we would like to introduce the four students who joined us at our facility during the summer months, as well as an Audiology Extern who will join us for the entire year.

Above: 2012 summer research trainees, supervisors and research team.

Gwendolyn Dillman

I am currently entering my third year of the Au.D. program at the University of Northern Colorado, and I plan to pursue a Ph.D. following the completion of my fourth year externship. I applied to the position of summer research intern at the NCRAR to increase my knowledge of the research process, as well as further my interest in pursuing a career in research. This opportunity allowed me to work with established researchers, while strengthening my research background as I plan a Ph. D. path. My research interests include the changes to the auditory system that occur throughout the lifespan, and the impact that aging has on speech understanding and auditory processing . I am also interested in the clinical application of electrophysiology to further understand the impact of aging. With this in mind, while at the NCRAR I was able to step into the developmental stages of using the frequency following response (FFR) in detecting the fine structure and envelope of responses to synthesized speech. This data was compared to psychophysical data collected as part of a grant with Dawn Konrad-Martin and Curtis Billings. Working alongside Luke Baltzell, I was able to collect pilot data that will lead to a further investigation of the usefulness of FFR in determining speech understanding and word recognition speed in the aging auditory system.

Brittney Dullard

I am currently entering my fourth year of the Au.D/Ph.D program at the University of Connecticut. I have known since my undergraduate studies, where I was introduced to research, that I would like my career path to include both clinic and research. I applied for the summer trainee internship at the NCRAR in order to further my experience with the research process, as well as gain a different perspective through an outside facility. My research interests include amplification, aural rehabilitation, and hearing aid outcomes in the adult population. Outside of class, I serve as vice president for our local chapter of the Student Academy of Audiology and am a member of the Ph.D. and Programs Student Subcommittees for AAA. I am also a teaching assistant for two undergraduate classes at the University of Connecticut. When I return to Connecticut, I will begin work on my dissertation project and preparations for my 4th year externship. After completion of my Au.D and Ph.D degrees, I hope to work where I am able to incorporate research, teaching, and clinical skills. The invaluable experience gained at the NCRAR this summer will enhance the rest of my education and my career in research!

Michelle Hungerford

I feel very fortunate to have the opportunity to be the Audiology Extern at the NCRAR this year. I began in this field by obtaining my undergraduate degree in speech and hearing science from the Ohio State University. This was where I was first introduced to research and gained both a passion and an appreciation for the research process. As an undergraduate student, I had the opportunity to work in a lab where I studied effects of auditory-visual integration. I then pursued a doctorate in audiology from Washington University in St. Louis, and it was here that I gained a clinical foundation in audiology. My passion for research led me to spend my free time during those years to work in a biological lab, researching the effects of drugs on the prevention and treatment of hearing loss. I also completed a capstone research project that looked at the efficacy and reliability of a new test of vestibular function. I hope that the experiences that I gain this year while I am at the NCRAR will help me to discover my research interests, and prepare me for my future career in the field. After this year, I hope to continue my education and begin work on a PhD.

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NCRAR: Meet Our Students (Continued)

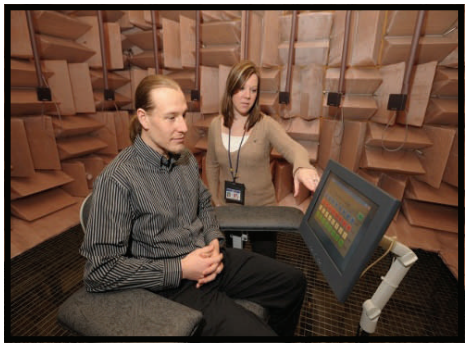
Louisa Conwill

I was brought to the NCRAR through a program by Portland's Saturday Academy called Apprenticeships in Science and Engineering, which sets up high school students for internships with adult mentors in scientific fields. I applied to work with Robert Folmer on his transcranial magnetic stimulation (TMS) study because of my interest in cognitive neuroscience. While at the NCRAR, I have explored this interest not only through the TMS study, but also through analyzing data from a study involving central auditory processing and cognitive function in patients with multiple sclerosis. Upon starting at the NCRAR, I had just finished my junior year of high school at Central Catholic in Portland. Soon I will be moving back to my hometown, Tokyo, where I spent the first nine years of my life. I will complete my senior year in Japan before returning to America for college. I enjoy singing, especially in a choral setting, running cross-country, and reading about the complexity of science. My claim to fame at the NCRAR is that I can lick my elbow, but a little-known fact is that I can also raise each of my eyebrows individually.

Sarah Weidman

I was first introduced to the NCRAR two years ago when I spent a summer working as a high school intern with Dr. Konrad-Martin for the Institute of Science and Math (ISM) program. I had such a positive experience that I chose to apply for a second summer research internship with Dr. Folmer through the Portland VA Research Foundation (PVARF). I am entering my second year at Mount Holyoke College in South Hadley, MA, and am currently a psychology major. I am also considering studying biology and neuroscience. In my free time, I enjoy planning and organizing events, and have served as the social chair for my class and the rugby team (and play as a forward on the field!). In addition, I am the trombone player for the MHC Klezmer ensemble. This upcoming semester, I plan on using some of the knowledge I gained this summer to become a mentor at the speaking and writing center. My experience at NCRAR will undoubtedly influence my future in science and research.

Ongoing NCRAR Research Studies



- A Hearing Loss Prevention Program for Veterans
- Assessment of Auditory Function in Patients with Parkinson Disease
- Auditory Rehabilitation from the Perspective of the Significant Other
- Central Auditory Processing Deficits Associated with Blast Exposure
- Clinical Trial of Transcranial Magnetic Stimulation for Relief of Tinnitus
- Determinants of Word Recognition Speed in Older Listeners
- Effects of Aging and Hearing Loss During Rapid Sound Processing
- Effects of Speech in Noise Training on Physiology and Perception
- Electrophysiology and Perception of Speech in Noise
- Hearing Loss and the Perception of Complex Sounds
- Individualized Objective Techniques for Early Detection of Ototoxicity
- Integrating Auditory and Visual Information to Improve Hearing Aids
- Joint DoD-VA Hearing Loss Prevention Program
- Longitudinal Changes in Auditory Function Among Veterans with Diabetes
- Mechanisms of Imbalance and Falls in Multiple Sclerosis
- Multi-site Evaluation of Progressive Tinnitus Management
- Multi-site Study of the Efficacy of Speech Perception Training for Hearing-Aid Users
- Predicting the Benefits of Spatial and Spectrotemporal Cues
- Telephone Tinnitus Education for Patients with TBI
- Wideband Clinical Diagnosis and Monitoring of Middle Ear and Cochlear Function.

2012 NCRAR Open House

In honor of the new vestibular laboratory, the NCRAR hosted its third ever Open House on Wednesday October 24, 2012. A ribbon-cutting ceremony commenced the event, and it was followed by tours for members of the VA community, and demonstrations by NCRAR staff. The enthusiasm of attendees made the event worthwhile for all who took part in it. Photos courtesy of Michael Moody and Steve Lathrop.

(Above) NCRAR Director, Dr. Patrick Feeney, addresses the crowd during the ribbon cutting ceremony.

(Left) Portland VA Acting Medical Center Director, Mr. David Stockwell, joins Dr. Feeney in cutting the ribbon to the vestibular laboratory.

(Above) Members of the NCRAR and Portland VA community socialize in the lobby during the NCRAR Open House.

(Above) NCRAR staff members provide demonstrations in the vestibular laboratory.

(Right) NCRAR Research Audiologist, Dr. Serena Dann, and Research Investigator, Dr. Dawn-Konrad Martin.

(Above) Former NCRAR director, Dr. Stephen Fausti, gives a thumbs up while at the Open House.

(Above) NCRAR Research Audiologist, Dr. Jay Vachhani and Research Assistant, Ms. ShienPei Silverman.